SONDERSEMINAR
LMU/MPQ

am:	**Mittwoch, 26. Mai 2010**
Uhrzeit:	**11:00 Uhr s.t.**
spricht:	**Caspar Ockeloen** **Van der Waals-Zeeman Institute** **University of Amsterdam**
Thema:	**Probing Fluctuations in a Lattice of Mesoscopic Atomic Ensembles**
Ort:	**LMU/Fakultät für Physik** **Schellingstraße 4, IIIrd floor, Seminarraum H 311**

gez. Prof. T.W. Hänsch

Abstract

The study and control of particle number fluctuations has revealed a rich variety of intriguing quantum phenomena in ultracold quantum gases, such as atom (anti)bunching effects, many-body correlations, squeezing and entanglement. We have developed a novel atom chip, hosting a vast two-dimensional lattice of magnetic microtraps. Rapid density-dependent losses in these tightly confining traps are a robust way to prepare small ensembles comprising tens to hundreds of atoms each. Surprisingly, random three-body loss of atoms naturally leads to sub-Poissonian atom number fluctuations, analogous to intensity squeezing in optics. We measure a relative variance or Fano factor of 0.53 in good agreement with theory. We expect this to be an ideal system for the study of collective excitations produced via laser excited Rydberg states for quantum information processing or as a resource for quantum metrology.